DOCUMENT RESUME

ED 180 881 SO 012 248

AUTHOR Tiemann, Adrian R.
TITLE Environmentalism and Social Change.
PUB DATE 21 May 79
NOTE 26p.: Presented at the National Conference on Energy and the Environment (Sixth, Pittsburgh, PA, May 21, 1979)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Activism: *Ecology: *Economic Development: *Environment: Environmental Influences: Federal Regulation: Futures (of Society): Government Role: Industry: Information Needs: *Public Opinion: Social Attitudes: *Social Change: Social Planning: Social Science Research: *Technological Advancement: United States History

ABSTRACT

A high level of individual concern with environmental issues characterizes the ecological crisis of the 1970s. In spite of this increased public involvement, however, many basic problems facing humans as they interact with the environment have remained constant throughout history. For example, the sometimes conflicting concepts of scarcity, dominion of humans over nature, stewardship of the environment, and preference for nature over artifice and/or vice versa, are interwoven throughout history. These issues developed in the United States during the 1800s into concern over welfare versus individual progress, urban (industrial) versus rural (agricultural) values, and social welfare movements designed to care for less fortunate people and wild creatures. During the 1970s, major developments on the environmental scene included the professionalization of protest, the spread of negative attitudes toward industrial pollution and wasteful practices, and the widespread conviction that environmental and energy problems could be controlled through social action. Policy makers will be more successful in solving social/environmental problems if they review past solutions to environmental problems and if they employ social science research techniques to investigate areas such as social forecasting, reactive market research, setting and achieving environmental goals, and analyzing data by more sophisticated means. (DB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED180881

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ENVIRONMENTALISM AND SOCIAL CHANGE

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Adrian R. Tiemann
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

by

Adrian R. Tiemann
General Electric Company
Corporate Research and Development
Schenectady, New York 12301

Presented at the Sixth National Conference
on Energy and the Environment
Pittsburgh, PA

May 21, 1979

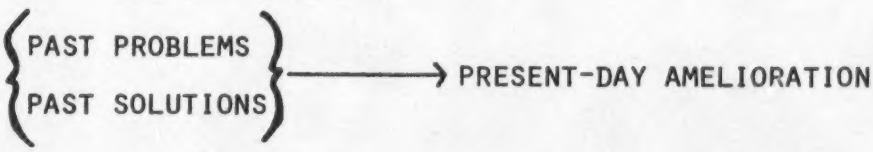
SP 012 248

ENVIRONMENTALISM AND SOCIAL CHANGE

The 'ecological crisis' which spurred $10.2 billion of spending on environmental cleanup by all levels of government in 1976, created EPA, DOE and a host of related agencies through some 25 national acts, and which has had a profound impact upon industrial innovation, is neither a set of new social phenomena, nor is the debate surrounding it novel. Both the phenomena and the debate are abiding problems in societies over the eons. Both are outgrowths of the ways in which societies are arranged and social accounts are kept according to the ideas which organize these activities. And so we do have a sense of *deja vu* in confronting environmental problems, because our forefathers and their ancestors dealt with them, too, and in the process developed norms -- that is, social rules -- for their "control."

What is different today is the spectrum of concern, and the degree to which individual consciousness has been raised about environmental issues. I'd like to review both some of the "problems" which elicited social concern in the past, and the context of ideas within which solutions to those problems were framed. From this historical overview, I'll develop some suggestions as to how the present situation may be ameliorated from a technological perspective. Because I am a social scientist, I will focus on the idea component first. In my discipline, we

HISTORICAL CONTEXT:



often assign priority to ideas because the more "advanced" the society we are studying, the more likely social action is to stem from ideas rather than from

physical events. I grant you, this is a simplification, and strictly speaking probably not true, but I wanted to explain my bias to you since I think it probably differs from your own as physical scientists and engineers. To give you a technological example: it was the idea of coal as a fuel that enabled some societies to mine and use it. Others used it for jewelry. Hence, coal in and of itself as a physical object did not necessarily spur people to think about it as an energy resource, and it took some people a long time to see the connection between that pretty black stuff and the way in which it could assist their material welfare. Other people even 'forgot' its uses once they had foregone them for a while. For example, although the English had used coal as a fuel for hundreds of years before they came to America, one enterprising gentleman who tried to sell it during the 1830's wrote:

> "The early efforts to introduce the use of coal to these markets were attended with uninterrupted loss..." [1]

and another report said:

> "David Handy purchased some lands near the Blount County line. On this land there was coal in the bed of the Warrior River. He built two flat boats in the fall and loaded them with coal and floated them to Mobile. In Mobile nobody would buy the coal. He had to give it away and send a Negro along with every bucketful to show the people how to light and burn it." [2]

So I want to start with the ideas which underlie the environmental debate.

1. THE IDEAS UNDERLYING THE ENVIRONMENTAL DEBATE

Throughout history, people have sought answers to certain fundamental questions. These might be called the "basic human problems," and when you come right down to it, there are only a limited number of them. Their solutions are equally constrained. Anthropologists Kluckhohn and Strodtbeck[3] have identified these as: the nature of people, people's relation to nature and supernature, people's place in history, people's relation to other people, and the nature of people's activities.

COMMON HUMAN PROBLEMS:

Nature of people
People's relation to nature and supernature
People's place in history
People's relation to other people
The nature of people's activities

Our focus is going to be on the second of these: people's relation to nature and supernature, for this is the context of environmental reform. Now Lovejoy et al.[4] have found some 66 basic conceptualizations of nature existing in philosophic thought, which I have collapsed to 9 categories for simplicity. Each of these categories contrasts a positive attribute of nature as against a negative characteristic of something artifactual.

NATURE

1. intrinsic character of object
2. intrinsic standard of value
3. inherently "true"
4. cosmic order, divinely ordained
5. healthy state of being
6. original condition
7. existing independently of humanity
8. spontaneous
9. "real" law

It is immediately apparent that the antitheses of these concepts are pejoratively related to people as builders, thinkers, artificiers, and independent entities in the cosmic scheme. In short, these are opposite to the characteristics which are summed under the term "vanity" as the vainglorious activity of little

NATURE	vs.	ARTIFICE
1.		"manufactured" character
2.		imposed standard of value
3.		defined by agreement to be true
4.		man-made order
5.		kept alive
6.		"created" condition
7.		dependent upon humanity
8.		artificial
9.		man-made law

people seeking the power of the gods. In making this distinction, the categories have been somewhat caricatured, but you can see more clearly this way. If we assign all qualities of goodness to nature, and to the God or gods responsible for nature, then it follows that people are limited by definition, and their efforts cannot lead to the attainment of the highest ideals. Those are reserved to the deities.

And so we have an idea and its antithesis, the idea of nature versus artifice. And around this metaphysical antinomy have grown deeply revered symbols and ideologies which, in their various forms of expression in different cultures throughout the ages, have come to be part of our own intellectual heritage. As such they have helped to form the framework in which we ourselves evaluate experience.

In 5th century Greece, during its "Enlightenment," this debate between nature and artifice was raised in a particularly strong manner. There are, after all, periods in history when one set of ideas exist pretty much without challenge. But from the 5th through the first centuries B.C., philosophers gave free reign to their varying ideas. The nature-artifice antinomy is expressed in the Prometheus legend, as Diogenes records. Zeus correctly punished Prometheus for delivering fire to the people "that was the origin and starting-point of softness and luxury among men. (For) man's cleverness...has been of small benefit to the life of those of after times. For men do not use their intelligence to promote manly virtue and justice, but in the pursuit of pleasure."[5] The philosophical issue was how to achieve perfect happiness in a world where scarcity, if it did not exist, would be obtained by the escalation of insatiable desire, and that therefore, desire was evil. The Stoics, Epicureans and Cynics argued that the solution was the devaluing of material objects and foregoing their use. Materialists, such as the Sophists, on the other hand, argued that invention was the source of human

happiness, and should be furthered. These contenders moved about on the Athenian scene, eliciting as much criticism then as our own activists do today. Contemporaries remarked on how the "Stoics loved to be among the crowds they claimed to despise, displaying an inverted vanity and ostentatious poverty." [6] When you sit down to enjoy your next feast at a fine restaurant, you might muse on the fact that the original agenda of the Epicureans was to destroy the vice of desire at its source by bringing it down to an irreducible minimum. This fact provides an ironic twist in contemporary language, because during that time it was the Sophists who argued most aggressively against this naturistic primitivism. Today, of course, Epicurean taste is revered as the finest while "sophistry" is reviled as unworthy argument! (This insight gives you some idea of the biases operating in our own society.)

As I see it, this debate raged on through the centuries to follow pretty much at the same level. In other words, between one view's being dominant and then another's, the oscillations varied about an average which did not include some of the issues that have been raised today. Christianity did not solve the paradox either, for it asserted that man rightfully exerts "dominion over nature" while at the same time it exhorted him to practice "stewardship."[7] These ideas are even referenced in the same location in the Bible:

> "And the Lord God took the man, and put him into the Garden of Eden to DRESS it (dominion) and to KEEP it (stewardship)."
>
> (Genesis II:15)

And they appear in other religious texts as well, showing how pervasive are these concerns throughout human society.

A significant change occurred with the awakening in Europe signified by Renaissance and the developments in all fields of learning -- the printing press,

the equal tempered scale, perspective in art, and most of all, the Copernican Revolution. Prior to that time, Ptolemaic astronomy had portrayed a world divinely ordered and "anthropocentric." Knowledge and religion were happily wed and man was secure in his ordained world. In other words, there was no disjunction between the knowledge portrayed by the Ptolemaic conception of the physical universe, and the belief underlying the Christian conception of the cosmos. In both, earth was the center by virtue of its "known" position, and philosophically, man was the primary focus. We call this "anthropocentrism," and it is a viewpoint which has been venerated over the world and all of its cultures throughout time. Under the sway of anthropocentric belief systems, people tend to be fatalistic. Since the courses of their lives have been charted by omnipotent force(s), there is very little reason for them to exercize any initiative. Substantial change would not be possible in any case. It is not difficult in such a belief system to incorporate political elements such as the "divine right of kings," and so on, all of which create a very neat social system with a place for everybody, and everybody in his place. Copernicus and his followers brought the anthropocentrism of this existing philosophical thought to its knees by implicitly demoting man from his central place when they asserted that the earth was merely a planet circling a much larger and more important star in a galaxy filled with stars. To understand the impact of this reconception of the universe, you have to realize that not only was "knowledge" altered, but with it went an entire section of the religious justification scheme; a whole portion of "belief" was demolished. Unloosed, unhinged and uprooted, man became motivated to look out for himself, to distrust authority and to think for himself. The Protestant Reformation is one manifestation of that trend. People began to develop a pragmatic philosophy, and its objectification, science. But people also began to become alienated because the world was a more chancey place and they were

no longer "safe." After all, if the earth were an infinitesimal place in the universe, it and its inhabitants could not be very important to the Creator. People were probably not "number one" on the Deity's list after all. Thus, what happened to them was not a result of divine intervention, but often just plain bad luck, mismanagement, or chicanery and malfeasance. And so people began to worry about events in a new way, and to be concerned with issues that had not arisen earlier. The variety of these concerns we call "humanitarianism," and it, too, developed in the context of this antinomy between nature and artifice -- primitivism and progress. The difference is that humanitarianism ratcheted the oscillation a notch higher as noblesse oblige slowly but surely became a more universal concern. That is, a much broader segment of the population felt a responsibility for others. And so for another several hundred years, the course of the debate continued on its way as industrialism grew and the New World was established.

2. THE ENVIRONMENTAL DEBATE IN THE UNITED STATES

The United States was established at a period when the idea of nature served as a particularly powerful integrating metaphor.[8] The vast territory opened for exploration was a boon to natural history studies, and travelers rhapsodized about the grandeur of the mountains, the clarity of the streams, and the wealth of flora and fauna. Moreover, the land and its resources, were by comparison with European standards, essentially free. And so even ordinary people developed a special relation to the land which was to enable them to attain the status and wealth denied them in their original homelands.[9] Philosophically, the synthesis they sought was fashioned from a transcendental naturalism[10] which democratized but did not deny Calvinism. (You will recall that according to predestination, individual action could not avail against one's ultimate fate. However, the preaching of the Great Awakening of 1730-40 and again in 1830-50, implied that

if one rejected worldliness and returned to faith that salvation would indeed be one's reward.)

Following the era of good feelings which "success" in the War of 1812 among other things brought about, Americans rallied to the bright banner of religious revivalism. Under the sway of its optimistic reformism, they targetted about every ill in sight from 1830-1850: women's suffrage, pacifism, temperance, prison reform, the abolition of capital punishment, universal education and the abolition of slavery. This Humanitarian outburst was deeply religious and communal in origin, and fed by the conviction that achievement of any goal was not only possible but necessary to salvation. This movement was counted the "single most important trend of the times" despite the fact that its following was never large, for it set the stage for reformism, including the environmental movement, thereafter. And it expressed in the spirit of the times, that old antinomy between primitivism and progress we met before.

But it was not simply due to an excess of missionary zeal. The development of the transportation network between 1829 and 1837 was attended by outrageous political and economic chicanery as railroads secured their positions through fraud, villainy and special privilege. The monetary panics of 1837 and 1839 were revealed to have involved widespread corruption. And from 1830 to 1850, ten times as many immigrants (2.5 million) entered the country as had done in the previous thirty years. After 1830, class lines hardened as voting rights veneered the realities of machine politics, and nativism reared its ugly head. Caught between the interests of social welfare and individual progress, which these issues raised, the U.S. became preeminently a philosophical battleground for the primitivism versus progress debate. Side by side, this period's analogues of nature (the transcendental call for moral reform and spiritual regeneration through modified asceticism) and progress (the frontier's beckoning promise of the rewards of exploitation) marched through time in uneasy union and occasional mortal combat in that peculiarly

American institution of pluralistic politics. So the first period, identified as a proto-environmental debate, was that between 1830 and 1850.

There might have been a secondary premonition of environmental concern in the 1860's had not the Civil War and its aftermath engaged everyone's attention. But with a variety of more pressing (not, however more important) problems to contemplate, such as increasing labor agitation, race riots and agricultural depression, the nation's energies went elsewhere. Instead, the second flowering took place when the nation had progressed further economically, and was beginning to consolidate its position internationally. Accordingly, the reform era that ensued lasted both longer and permeated more sectors of society because by then the various reform movements had generated a much larger political following. This began between 1880 and 1890, when some of the diverse banners were united under the guise of populism, and it flowered in the Conservation-and-Trust-Busting efforts of Teddy Roosevelt. Once again, there were substantive reasons for reform. Hordes of immigrants, some 9 million of them, arrived between 1880 and 1900, threatening the already shaky positions of the previous wave. From 1896, this influx was largely composed of non-WASP peoples. They settled in the cities, which were already unable to manage having them, and transformed the demographics of the country from 28% urban to 40% urban as the nation lost its rural character and moved solidly into industrialism.

Against a backdrop of agricultural and economic depressions in 1870 and 1893, and an agrarian revolt in 1887, Populists demanded government ownership of railroads, parity for farmers with business and industrial interests, free money and tariff reform. Once again, railroads emerged as powerful villains with the capability of making or breaking towns they chose to favor, using heavy-handed techniques to subdue labor unrest, and having their chicanerous acts revealed in all their grisly glory by the muckrakers. While industrial production doubled, labor unrest skyrocketed, there being 1600 strikes in 1886 alone. Rockefeller

built his Standard Oil Trust, and when that was scotched, moved it to the domain of a holding company. As Burch points out, "except at periods when food is scarce, the farmer is at a severe disadvantage in competition with industry. His ability to rationalize his operation is limited by the fact that the supply of his product is not simply managed by the success or failure in the persuasiveness of advertising, but is dependent upon natural processes."[11] The agriculture versus industry conflict was a living model of the nature versus progress debate, and it became prominent just when Darwin's and Spencer's ideas were attaining wide audience. Industry used the tooth and claw aspects of these explanations of evolution through survival of the fittest to justify its expansion and exploitation of natural resources, while social reformers saw evolutionary theory as promising a better life through change. Bested in the battle for political supremacy which they lost in 1865,[12] agrarians joined with reformers to broaden their demands to include not only those of agriculture, but of the nation's resources as well.

The social reformers were joined by

> "A new generation of economists, sociologists and political scientists who were undermining the philosophical foundations of the laissez-faire state and constructing a new ideology to justify democratic collectivism. Together with the activities of social gospel ministers and social workers, they sought to enact a broad program of Progressive reforms." [13]

The conservative movement at the turn of the century manifested the middle class' adoption of a broader definition of humanitarianism. Even God's weakest creatures -- say others less fortunate, or wild creatures -- become one's responsibility when one's status in society rises. As long as one is on the bottom of the ladder, one is responsible only to oneself, for one has insufficient resources to accomplish any more than subsist. The reform movements of the 1830's began the process of widening the perspective of relevant objects to be cared for and set the tone for future debates. Thus, environmental issues were bound in with others such as voting rights and land reform. The country was not wealthy enough to afford such high levels of concern as environmentalism today represents.

The third era of social reform was organized more specifically around environmental issues, and owed its genesis to the stock market crash of 1929 and the subsequent depression together with the dust bowl of the 1930's. Once again, the agricultural sector was hard hit, but this time it was joined by urbanites, too, as industry failed in the wake of the market crunch. Both Hoover and Roosevelt initiated a variety of broad federal programs aimed at shoring up both industrial and agricultural weaknesses: the Agricultural Marketing Act which created the Federal Farm Board, the Reconstruction Finance Corporation, the Agricultural Adjustment Administration, Civilian Conservation Corps, Farm Credit Administration, Civil Works Administration, National Youth Administration, National Labor Relations Board, and others sought to remedy the defects of the existing system. But by 1938, the conservative tide was running against Roosevelt, with spectacular incidents of union organization violence and isolationism rising.

In all of these cases, reform movements have been successful in attaining only some of their goals. For example, the land reform demands of the 1830's led eventually to the Dawes Act of 1887 in which, under the guise of settling the rehabilitatable Indians and opening lands to homesteading, millions of acres of public land were distributed. The chief beneficiaries turned out to be land speculators rather than settlers, and eventually 81 million acres were restored to the public domain. The Sherman Anti-Trust Act of 1890 was first used, in 1895, against a labor union! And coming down to the more recent past, Selznick[14] has argued in the case of TVA that the national conservation goals of the 1930's were subverted by the social structures in which they were forced to operate so that soil conservation measures ended up enriching the wealthy rather than benefitting the poor whom it was intended to aid. In short, while reformism made progress, it was slow progress, and there were many loose ends left over to provide grist for future mills of discontent. This brings us down to the latest wave of environmentalism.

The second World War interrupted the nation's isolationism and subsequently, peace brought the country face to face with the serious problems connected with the implementation of modernity throughout the world. An initial post-war prosperity and euphoria, which led to rapid suburbanization and the baby boom, were marred by worldwide crises such as the Korean war, troubles in the Middle East and the Cold War; and homefront difficulties such as sit-ins, McCarthyism, the steelworkers' strike and continued unemployment. Against this backdrop of rising dissatisfaction and revelations about governmental activities, critical attention was to focus on what has been called the "military-industrial complex," with its attendant cynicism regarding national goals. "Alienation" became the catchword of the 1960's and many people saw the government's attitude as "the public be damned."

Enormous changes had been wrought in society by the technological by-products of wartime developments. Jet travel, electronic data processing and bank transfers, artificial satellites, solid state electronics, xerography and biomedical advances such as fertility control, among others, all contributed to changing the complexion of American society. These changes also caused a host of middle class values to be brought into question owing to the changes in the nature of the relationship between people and their jobs, and between men and women at home and at work. With the communications explosion, industry could decentralize; with technological help, people could attain a more widely defined "good life;" and with something like an uneasy prosperity, such a wide variety of people could indulge their desires that the 1970's has been called the "me" generation.

Philosophically, the moral law of middle class values, which presumably undergirded institutional authority, became a topic of debate as people of opposite sexes began to live together without marrying, and people of the same sex began marrying, and both insisted on having children by whatever means. With values in doubt, authority's demise is not far behind, and the insecurity created by this conjunction is a powerful spur to reformism.

Hence, it is not surprising that basically conservative religious movements cloaked in hippie attire, bible belt spangles, and middle western Sunday best should arise throughout the nation as they had during the "Great Awakening" of 1730-40, and in the Revivalist movements of the 1830's to 1850's. Nor is it surprising that mainstream Protestantism should heed the calls to moral arms that accosted it on every front, and that it should come to the forefront of environmental reform. Just as earlier advocates had argued against what they perceived (from their more limited perspectives) to be the major faults of the allocation system under market forces, and sought to regulate those, so now the advocates of the 1960's and 1970's were arguing against what they perceived (with their more scientific perspective) to be the major faults of this allocation system as it currently worked. Remember, the knowledge explosion that accompanied industrialization in this country, and the increasingly higher levels of education attained by a larger fraction of the population, put more people in touch with the underlying realities of public and private policy decisions. They could look at history and draw lessons from it, and what they saw when they looked up "pollution" was disconcerting. The public has historically perceived the avidity of industry for profits. (Concomitantly, it has not always appeared to recognize the relationship between this avidity and its own welfare.) And it has generally criticized industry for externalizing its costs: earlier, this externalization was perceived to exist in the form of exploiting labor. With the rise in consciousness that attended the social explosions of the 1960's, externalization took on the broader meanings to which we have become accustomed under environmentalism. The very technological advances which facilitated postwar industrial growth into new fields, spurred environmentalism. The gas chromatograph, mass spectroscopy, large scale computers, bioassay techniques and the ability to maintain large rat colonies for extended periods of time without suffering attrition due to infectious epidemics -- all helped document the externalities which rising consciousness made perceptible.

TECHNOLOGICAL AIDS TO MONITORING

gas chromatograph
mass spectroscopy
large scale computers
bioassay
ability to maintain rat colonies

In each of the preceding reform cycles, I have tried to show how a combination of precipitating factors, involving both subjective elements as well as substantive ones, none of which may have been significant enough in its own right, combined to form an aroused electorate. We can look at these in historical perspective, (see Chart 1) beginning with the nation's founding during a period in which the idea of nature served as an integrating metaphor, coming down through the "Great Awakening" of 1730 to 1740, some Indian wars and the Revolutionary War to the beginning of the 19th century. A heyday of optimistic speculation and nationalism in the "era of good feelings" following the War of 1812 was brought to a close with revelations about corruption in the key industry of the time, the railroads, which brought into question the dominant idealogy of "innocent expansionism." The Populist-Progressive era in politics followed the Civil War and a reign of "Bourbons" in the south, muckraking disclosures about machine politics, scrambles for concessions, franchises, public lands and legislative seats, industrial-banking chicanery, an extended and pervasive agricultural depression, and the difficulties of adjusting to an unprecedented number of immigrants, -- all of which factors served to threaten the emerging value consensus of the public as Catholics fought Protestants, White fought Black, and labor fought industry. The New Deal followed a decade of sectarian pettiness epitomized by the Jazz age, accompanied by rampant land speculation, as in Florida, mass lawbreaking, and an unprecedented stock market crash. All of these cycles were reactions to what Rubin[15] calls "one-way laissez-fairism," that is, government aid

to business without government regulation, or what the public saw as a massive repudiation of its trust.

They were also the public's reactions against an increasingly distant and bureaucratic control over their lives by the increasing scale and scope of operations of the institutions affecting them, governmental or private. If one were to sketch the rise of the environmental movement, including all of its cousins, it would show an undulating but stepwise progression as the breadth and scope of issues embraced under its aegis (implicitly the breadth and scope of the targets of its attack) were enlarged. (See Fig. 1) Implicitly, reform movements represent the public's lack of trust in official or existing institutions, because there is no need to change institutions which are performing well and have broad public support. The institutions which have come under increasingly severe attack in the most recent wave of environmentalism differ from those targetted in the past because the public has become increasingly sophisticated. There may be nothing new under the social sun, but what is new is the professionalization of protest. This professionalization mitigates against the backlash's being able to secure a retrenchment of the reforms enacted. This brings us to the question of what can beleagured industry do? Let us answer this question by first asking what the difference between industry's and the public's attitudes are.

3. PUBLIC AND INDUSTRY ATTITUDES

Industry, like the public, operates under the implicit mandates of the nature-artifice antinomy. It must husband its economic resources in order to develop further; but it is generally required to exploit every advantage for the sake of its stockholders. As the public's perception of its responsibilities towards itself and others, and eventually, towards its wider environment increased, industry's did not.

This disparity of viewpoints between the public and the business sector is responsible for much of the polarization that exists in the environmental movement. Industry, under sway of the very same ethic which motivates the public to adopt the ecological perspective, does not have the same perception of its moral duty.

In this disparity, there are some constraints on business which reformers must take into account. The financial resources of industry in this country are allocated according to where the most likely and largest return is probable. No venture can secure capital unless it provides an adequate return. In the postwar euphoria, venture capitalists rushed to provide funding to industrial development. This merely follows the historical pattern because the U.S. has been the home of the most widespread and eagerly adopted invention. By picking up invention industry could (directly and indirectly) offer advantages to the public in improved lifestyle the acceptance of which would return it large profits. In this, industry has typically led the public as it rode the crest of a technological wave. In this role, it is comfortable because it faces less uncertainty.

When technology in the 1970's lost momentum, partly because of overpromising, venture capital took its money out of industrial development. Together with the changing perceptions and priorities of the public's intellectual leaders, the public began to lead industry. Unfortunately, industry did not follow quickly enough. When people demanded smaller and less expensive cars with good safety features, Detroit dug in its heels and produced beautiful fin-tailed monsters as you all know. Accordingly, sales of foreign cars skyrocketed. Industry misread the signals because the interaction between what people are willing to pay for and what industry is willing to provide is a very complex matter. Similarly, when intellectual leaders among public interest groups began to question utility rate structures and what they perceived to be wasteful practices in the allocation of energy (for example: failure to implement district heating), utility executives

tended to respond sharply. They did not realize that they could no longer lead the public because that technological wave had crested and was now rolling calmly out to sea. People today have more education and more social power than did many of the monarchs of old, and they value themselves more. Like the nobility of the past who "knew enough to care," the public takes its responsibilities more seriously. This leads me to my final point: what shall industry do?

4. AMELIORATION

Today's industrial decision-maker must consider many more factors than were admitted in the past. It must be recognized that the customer is evaluating a broader spectrum of considerations than simply price, even if price may be the most important component. They have demonstrated this by electing politicians to office whom they perceive to value environmental considerations as much as they do. These same politicians have driven prices through the sky and have increased the regulatory burden on business to the point where it has been responsible for nearly a percentage point in inflation. This same public has also demonstrated a broader range of concern than price by purchasing products manufactured overseas, regardless of price, when American companies did not provide them with their desires. We have to be honest about this fact, that while price may have been a consideration in foreign purchases because of the subsidization overseas governments give their industry, noneconomic factors played a large role. You cannot explain the penetration of expensive European cooking ware in the American market on any other grounds than that it met a need not faced by our own manufacturers.

The same logic is true in utility provisioning. The public today looks upon utilities in much the same light as it did the railroads a century ago. Today's "robber baron" in the public's mind is often the utility representative at a Public Service Commission rate increase hearing. This image is not helped when fuel shortages evoke patriotic conservation which is met by large rate increases.

Industry has responded to the challenge before, and I am confident it will respond to it again. By casting aside some of the prickliness associated with the polarization in the energy-environment debate, utility planners can and should get together with their critics. They complain that the energy crisis is not a technological problem, for instance, but a social one. We do not lack the means of generating sufficient power; the quarrel is over the manner in which that power shall be generated, and whether we "need" as much power as has been traditionally forecast. We could shift from the non-transportation use of oil to nuclear or to natural gas and coal, and use the 18 quads of oil thus freed for transportation purposes. These alternatives are technologically feasible right now. But they are not socially feasible. Hence our energy crisis is mainly a social problem of getting people to agree not only on the means to the ends, but on the ends themselves. This perception of the social nature of environmental and energy problems has been with us since the 1950's.[16] Where is the evidence that this intellectual perception has been internalized? It does not reside in employment figures gathered a decade after the social nature of these problems was made clear.

TYPE OF EMPLOYER BY FIELD OF EMPLOYMENT, FULL & PART-TIME

(%)

Field	Educ.	Govt.	Indus.	Nonprofit	N
Physics	55.8	15.2	22.1	5.3	16164
Chemistry	37.0	6.5	52.0	4.4	26736
Earth Sci.	50.2	23.9	19.4	4.4	10109
Engineers	35.6	9.7	48.5	4.4	34317
Biosci.	67.0	12.9	11.8	6.1	53849
Psych.	61.3	8.2	5.4	17.7	24365
Soc. Sci.	83.3	6.6	3.6	4.3	25924
Average =	55.7	11.8	23.3	6.7	

Source: NAS: DOCTORAL SCIENTISTS & ENGINEERS IN THE U.S., 1973 PROFILE
NAS-NRC Report, December 1975.

If the excluded social science specialties (including psychology) were included in the industrial mix, what would the people in such jobs "do"? Why, they would provide the kinds of social forecasting that utilities have always wanted and never gotten from their conventional experts. They would help to develop meaningful conservation programs among utility companies' users that would stick because they would work, and they could monitor experiments in pricing structures to develop the data bases for price elasticities which economic theory merely assumes to exist. They would bring reactive market research to responsive life, exploring the new ways electrical generation and heating and cooking fuels could be managed to achieve environmental goals without punishing the public or destroying the utilities. Moreover, they would provide a vital link to future development, because future growth in all industry is going to have to take a wider view of its opportunities and responsibilities. For example, technology's promise is increasingly going to be called upon to provide answers to some of today's social problems. It will be called upon to provide physical parity for the handicapped. If we can put a man on the moon, then we ought to be able to get a wheelchair victim across town under his or her own steam. And people are going to be demanding this kind of help. For another example, have any of you ever lost the use of one arm? Have you ever tried to open a can with a manual or electric can opener? Try it when you get home. There is a demand for this sort of product. Social scientists are sensitive to these factors, and would provide important information for business planning.

Secondly, industry can help to provide the training that it claims its critics lack. There are a variety of avenues open to it, capable of addressing what appears to be a curriculum problem on many fronts. This curriculum problem consists in the malintegration across the disciplines of practical and theoretical knowledge relevant to the subject at hand but irrelevant from a traditional disciplinary point of view. Industry has been quick (and correct) to perceive

the lack of practical training on the part of many of its social critics. This failing compromises the ability of the social scientist to analyze numerous industry-environment problems because a substantial fraction of the data are "missing" as it were. (A similar failing in the other direction exists with regard to business administration curricula, which ignore issues that social theory posits can become problematical. Hence industry get poorer advice than it might whomever it consults.) By providing educational grants to students in the social sciences to take a year of business and economics courses beyond the conventional degree requirements, these gaps could be filled. Another avenue might be to offer summer internships at industry headquarters or within specific operating divisions for graduate students at which practical experience in industrial problems and management could be gained to complement theoretical training. In this way, people could round out the education which industry representatives see as so biased, and industry could be the same token, learn what its social critics feel is so important. Now I am not speaking in these cases of supplanting the discipline of Business Administration which performs a distinct and important role in the industrial enterprise. Rather, I am trying to round out the education of the social critics so that their comments can become both more meaningful and hence implementable, and have an appropriate impact upon improving the course of commerce. Clearly, this program implies a two-way learning process, for when social critics sharpen their tools, they will make more of a point as well.

In this cooperative effort, industry and its critics will surely find a common ground, for as I have shown, they are moved by the same underlying values. Those values have carried us, through their own progression and transformations into the present, and I am sure they will carry us securely into the future, too.

FOOTNOTES

1. Eavenson, Howard N. THE FIRST CENTURY AND A QUARTER OF AMERICAN COAL INDUSTRY. Pittsburgh: privately printed, 1942; quoted in S. H. Schurr and B. C. Netschert: ENERGY IN THE AMERICAN ECONOMY, 1850-1975. Baltimore: Johns Hopkins Press for Resource for the Future, Inc., p. 59.

2. Ibid.

3. Kluckhohn, F. and F. Strodtbeck. VARIATION IN VALUE ORIENTATIONS. Evanston, IL: Row Peterson, 1961. "Supernature" in this case is defined as the residual category of phenomena that cannot be understood in terms of current factual knowledge -- whatever it might be. Hence, such events or ideas are referred to spiritual, philosophical or mystical interpretations for clarification, that is, to the realm of belief.

4. Lovejoy, A. O. et al. PRIMITIVISM AND RELATED IDEAS IN ANTIQUITY. Baltimore: Johns Hopkins University Press, 1935.

5. Diogenes, in DIO CHRYSOSTOM, ORAT. VI, 25-26, 28-30, quoted in Lovejoy, et al., op. cit., p. 132.

6. Diogenes, op. cit.

7. Black, J. THE SEARCH FOR DOMINION: ECOLOGICAL RESPONSIBILITY OF MAN. Edinburgh: University Press, 1970.

8. Burch, W. R., Jr. DAYDREAMS AND NIGHTMARES. New York: Harper & Row, 1971.

9. Huth, H. NATURE AND THE AMERICAN. Berkeley: University of California Press, 1957.

10. Burch, op. cit., p. 91.

11. Ibid., p. 120.

12. Cochran, T. C. and W. Miller. THE AGE OF ENTERPRISE. NY: Harper Torchbooks, 1961 (1942), p. 121.

13. ENCYCLOPEDIA BRITANNICA 18: 983, 1975 Edition.

14. Selznick, P. TVA AND THE GRASS ROOTS. Berkeley: University of California Press, 1949.

15. Rubin, R. E. CRISIS IN EDEN. Boston: Little Brown, 1970, p. 81.

16. For example, see: N. Wengert: NATURAL RESOURCES AND THE POLITICAL STRUGGLE. New York: Doubleday, 1955; P. Valien: PUBLIC AWARENESS OF AIR POLLUTION AS A COMMUNITY PROBLEM IN ERIE COUNTY, NEW YORK. NYS Air Pollution Control Board, 1957; J. B. Sanderson: The National Smoke Abatement Society and the Clean Air Act of 1956. POLITICAL STUDIES 9, 1961, 236-253; S. Kraus, et al.: Mass Media and the Fallout Controversy. PUBLIC OPINION QUARTERLY 27, 1963, 191-205; E. Jonsson: Annoyance Reactions to External Environmental Factors in Different Sociological Groups. ACTA SOCIOLOGICA 7, 1963, 229-59; N. Z. Medalia: Air Pollution as a Socio-Environmental Health Problem. JOURNAL OF HEALTH AND HUMAN BEHAVIOR 5, 1964, 154-65; J. D. Frank: Galloping Technology: A New Social Disease. JOURNAL OF SOCIAL ISSUES 22, 1966, 1-14; H. Jarrett (ed.): ENVIRONMENTAL QUALITY IN A GROWING ECONOMY. Baltimore: Johns Hopkins Press, 1966; R. Dubos: The Social Role of Scientist and Citizen. SCIENTIST AND CITIZEN 9(2), Feb. 1967, 26-7; W. H. Whyte: THE LAST LANDSCAPE. New York: Doubleday, 1968; C. R. Wharton, Jr.: The Green Revolution: Cornucopia or Pandora's Box? FOREIGN AFFAIRS 47, 1969, 464-76; P. Shepard and D. McKinley, eds., THE SUBVERSIVE SCIENCE: ESSAYS TOWARD AN ECOLOGY OF MAN. Boston: Houghton Mifflin, 1969; M. Tanzer: THE POLITICAL ECONOMY OF INTERNATIONAL OIL AND THE UNDERDEVELOPED COUNTRIES. Boston: Beacon Press, 1969.

CHART 1

THE ENVIRONMENTAL DEBATE IN THE UNITED STATES

1. "NATURE" AS INTEGRATING METAPHOR: 1600 - 1700
2. THE "GREAT AWAKENING" 1730 - 1740
3. INDIAN WARS
4. REVOLUTIONARY WAR
* 5. RELIGIOUS REVIVALISM: 1830 - 1850
6. CIVIL WAR AND THE RECONSTRUCTION ERA: 1860- 1880
* 7. POPULISM AND PROGRESSIVISM: 1890 - 1915
8. THE JAZZ AGE
* 9. DEPRESSION AND THE DUST BOWL: 1929 - 1938
10. SECOND WORLD WAR
* 11. ENVIRONMENTALISM: 1960 - ?
12. THE FUTURE

* IDENTIFIED AS BEING CONNECTED WITH OR BEING "ENVIRONMENTAL" IN NATURE.

Fig. 1 THE COURSE OF ENVIRONMENTALISM IN THE UNITED STATES